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AGILENT TECHNOLOGIES, INC.  
Legal Department, DL429  
Intellectual Property Administration  
P.O. Box 7599  
Loveland, CO 80537-0599

EXAMINER
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SHIBUYA, MARK LANCE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/061,800  
Filing Date: January 30, 2002  
Appellant(s): SHCHEGROVA ET AL.

DAVID C. SCHERER, PH.D. & BRET E. FIELD  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed February 12, 2008 appealing from the Office action mailed August 6, 2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

MacBeath, "Printing Proteins as Microarrays for High-Throughput Function Determination," Science, New Series, col. 289, No. 5485 (Sep. 8, 2000), pp. 1760-1763. Declaration, entered 3/25/2005, which was filed pursuant to C.F.R. §1.131.

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

**Claim Rejections - 35 USC § 112, Second Paragraph**

Claims 1-33 and 49-53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellant regards as the invention.

Independent claim 1 has been amended to state the limitation "wherein the non-error second dispenser dispenses drop only where the identified error first dispenser did not dispense drops in the pattern for the selected path". Other independent claims 6, 25 and 52 state similar language and the same reasons for the instant rejection apply to all of the independent claims, *mutatis mutandis*. The examiner finds that there are at least three interpretations for this language.

First, this language could be construed to mean that the non-error second dispenser does not dispense any drops at all, except "only where" the identified error first dispenser should have, but did not, dispense drops in the said selected path. In other words, the first and second dispensers of a set can only deposit drops in the same locations. If a first dispenser of a set is found to be in error, a non-error second

dispenser of the same set, can only dispense where first dispenser failed to cover, and not in a separate location or pattern.

The examiner submits that this construction seems to be consistent, e.g., with appellant's traversal of the anticipatory rejection, in the Reply at p. 14/18, stating: "Specifically, the 'non-error' dispensers of Kumar et al. deposit drops in location other than where an error dispenser in the same set did not deposit a drop." This argument is repeated against the Hackleman and Anderson publication in the rejection for obviousness, (Reply at p. 15/18 and 16/18).

Secondly, this language could be construed to mean that non-error second dispenser dispenses drops only in those locations on the substrate in the selected path of, e.g., a first group, (of which the identified error first dispense is a member), **only where** the identified error first dispenser did not dispense drops in the pattern for said selected path of the first group. The examiner respectfully notes that this limitation encompasses the dispensing of drops, by the non-error second dispenser, that avoid any droplets resulting from a "soft nozzle failure" that resulted in a solution break up into multiple smaller drop during firing of the identified error first dispenser, (see, Invention Disclosure reproduced in the Appendix of the Declaration by all of the instant inventors, entered 3/25/2005, at p. 31, first paragraph [entitled "Problem"]).

Response to Arguments after Final Rejection, mailed 11/14/2007

Appellant argues the language "wherein the non-error second dispenser dispenses drop only where the identified error first dispenser did not dispense drops in the pattern for the selected path" is not indefinite because a second interpretation

contradicts other explicit limitations of the claims and thus is not an alternative interpretation. Appellant argues that that “non-error dispensers do not dispense at all”, as clear from the following limitations:

1. identifying error-dispensers (either “hard” or “soft” error dispensers);
2. depositing drops from non-error dispensers in the selected pattern; and
3. moving a second, redundant dispenser along the selected path while dispensing drops from a non-error second dispenser only where the identified error first dispenser did not dispense drops in the pattern for the selected path.

Reply after final rejection, at p. 10.

Appellant's arguments, entered 10/9/2007, have been fully considered but they are not persuasive. Appellant's argument that one of skill in the art would be reasonably apprised of the scope of the claimed invention by inspection of the identified claim limitations is not persuasive, because included among these limitations is the language that is, itself, the subject of the rejection under 35 USC 112, second paragraph. The examiner respectfully submits that this argument appears to be circular in its reasoning.

#### **Claim Rejections - 35 USC § 112, First Paragraph**

Claims 1-33 and 49-53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This rejection is for new matter.

Appellant's amendment necessitates the new grounds of rejection.

Independent claim 1 has been amended to state the limitation “wherein the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path”. Other independent claims 6, 25 and 52 state similar language and the same reasons for the instant rejection apply to all of the independent claims, *mutatis mutandis*.

The examiner respectfully notes that the specification, at p. 13, lines 30-31, states that “[o]nly one non-error dispenser in each set is needed during array fabrication.”

The claims now encompass methods wherein non-error second dispenser dispenses drops only in those locations on the substrate in the selected path of, e.g., a first group, (of which the identified error first dispense is a member), **only** where the identified error first dispenser did not dispense drops in the pattern for said selected path of the first group. The examiner respectfully notes that this limitation encompasses the dispensing of droplets, by the non-error second dispenser, that avoid any droplets resulting from a “soft nozzle failure” that resulted in a solution break up into multiple smaller drops during firing of the identified error first dispenser, (see, Invention Disclosure reproduced in the Appendix of the Declaration by all of the instant inventors, entered 3/25/2005, at p. 31, first paragraph [entitled “Problem”]).

The examiner respectfully submits that this species of method is not described in the specification as filed. The specification does not describe methods wherein a non-error second dispense only to those areas around imperfect deposition of droplets resulting from soft nozzle failures, as described in the inventor’s declaration pursuant to

37 CFR 1.131. Therefore, one of skill in the art would not envision that appellant had possession of the full scope of the claimed invention.

**Response to Arguments after Final Rejection, mailed 11/14/2007**

Appellant argues the language “wherein the non-error second dispenser dispenses drop only where the identified error first dispenser did not dispense drops in the pattern for the selected path” is not indefinite because a second interpretation contradicts other explicit limitations of the claims and thus is not an alternative interpretation. Appellant argues that that “non-error dispensers do not dispense at all”, as clear from the following limitations:

1. identifying error-dispensors (either “hard” or “soft” error dispensors);
2. depositing drops from non-error dispensers in the selected pattern; and
3. moving a second, redundant dispenser along the selected path while dispensing drops from a non-error second dispenser only where the identified error first dispenser did not dispense drops in the pattern for the selected path.

Reply after final rejection, at p. 10.

Appellant's arguments, entered 10/9/2007, have been fully considered but they are not persuasive. Appellant's argument that one of skill in the art would be reasonably apprised of the scope of the claimed invention by inspection of the identified claim limitations is not persuasive, because included among these limitations is the language that is, itself, the subject of the rejection under 35 USC 112, second paragraph. The examiner respectfully submits that this argument appears to be circular in its reasoning.

### **Claim Rejections - 35 USC § 102**

Claims 1-33 and 52 are rejected under 35 U.S.C. 102(a, e) as being anticipated by Kumar et al., US 6,283,572, (9/4/01: 3/4/97; of record, IDS entered 10/31/2006).

This rejection is maintained for the reasons of record as set forth in the previous Office action. That rejection is copied below for the convenience of the reader. This rejection is necessitated by appellant's amendments to the claims.

The claims of the invention set forth methods that utilize a set of non-error redundant dispensers to correct identified error dispensers. The methods claimed generally comprise the steps of loading each set of redundant dispensers with the same fluid; dispensing drops from the dispensers to identify an error; moving first dispensers or a frame of first dispensers along a selected path while dispensing only from non-error dispensers, and moving a redundant dispenser or frame with redundant dispensers along the selected path while dispensing drops from non-error redundant dispensers in the same set as the error first dispensers.

Kumar et al., US 6,283,572, throughout the patent and especially in the background of invention, col. 1, lines 43-50, teach that an inkjet printer prints ink dots at particular locations of an array, thereby reading on fabricating a chemical array. Kumar et al., at col. 7, line 23-col. 8, line 56, Figure 7, Tables I and II, disclose methods comprising redundant nozzles, wherein each nozzle is tested (col. 6, line 15-col. 7, line 8); and wherein malfunctioning dispensers are replaced by redundant dispensers. Kumar et al., col. 1, line 61-col. 2, line 10, teaches pulse inkjet dispensers.

Response to Arguments, mailed 8/6/2007

Appellant, in the Reply at p. 14/18, argues “the ‘non-error’ dispensers of Kumar et al. deposit drops in location other than where an error dispenser in the same set did not deposit a drop.”

Appellant's arguments, entered 5/29/2007, have been fully considered but they are not persuasive. Kumar et al., at Tables I and II teach deposition by redundant dispensers (nozzles 2, 50 and 98 of Table II) that dispense only where (i.e., Row 2) the defective dispenser (nozzle 146) should have, but did not.

Response to Arguments after Final Rejection, mailed 11/14/2007

Appellant argues the language “wherein the non-error second dispenser dispenses drop only where the identified error first dispenser did not dispense drops in the pattern for the selected path” is not indefinite because a second interpretation contradicts other explicit limitations of the claims and thus is not an alternative interpretation. Appellant argues that that “non-error dispensers do not dispense at all”, as clear from the following limitations:

1. identifying error-dispensers (either “hard” or “soft” error dispensers);
2. depositing drops from non-error dispensers in the selected pattern; and
3. moving a second, redundant dispenser along the selected path while dispensing drops from a non-error second dispenser only where the identified error first dispenser did not dispense drops in the pattern for the selected path.

Reply after final rejection, at p. 10.

Appellant argues that Table II and its description, as disclosed by Kumar et al., clearly state that “non-error” dispensers dispense drops both at locations where

identified error dispensers did not (i.e., where “error” dispense 146 did not) and at locations other than where identified error dispensers did not.

Appellant's arguments, entered 10/9/2007, have been fully considered but they are not persuasive. Appellant's argument that one of skill in the art would be reasonably apprised of the scope of the claimed invention by inspection of the identified claim limitations is not persuasive, because included among these limitations is the language that is, itself, the subject of the rejection under 35 USC 112, second paragraph. The examiner respectfully submits that this argument appears to be circular in its reasoning.

The examiner respectfully submits the limitations “second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path” encompasses “non-error” dispensers dispense drops both at locations where identified error dispensers did not (i.e., where “error” dispense 146 did not) and at locations other than where identified error dispensers did not, as taught by Kumar.

### **Claim Rejections - 35 USC § 103**

Claims 1-33 and 49-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar et al., US 6,283,572, (9/4/01: 3/4/97; of record, IDS entered 10/31/2006), and in view of MacBeath, "Printing Proteins as Microarrays for High-

Throughput Function Determination," Science, New Series, col. 289, No. 5485 (Sep. 8, 2000), pp. 1760-1763.

Appellant's amendment necessitates the new grounds of rejection.

Kumar et al., is relied upon, as in the above rejection for anticipation.

Kumar et al., does not disclose methods comprising fabricating an array that is a biopolymeric array, in claims 49-51 and 53.

MacBeath, "Printing Proteins as Microarrays for High-Throughput Function Determination," Science, New Series, col. 289, No. 5485 (Sep. 8, 2000), pp. 1760-1763, throughout the publication, and at p. 1760, right-hand column, teach using contact printing to fabricate protein arrays.

It would have been *prima facie* obvious to a person of ordinary skill in the art at the time the invention was made to combine methods comprising dispenser technology include the step of identifying an error dispenser as taught by Kumar et al. in the method of MacBeath et al., biopolymeric arrays are fabricated.

One of ordinary skill in the art would have been motivated use printing methods to fabricate biopolymer arrays because MacBeath, in the abstract, teach the use of such methods to permit high-throughput assays of thousands of proteins.

Thus it would have been reasonable for one of ordinary skill in the art to look to the field of printer technology at the time of invention given that microarray production companies were innovating with concepts borrowed from printer technology.

Response to Arguments after Final Rejection, mailed 11/14/2007

Appellant argues the language “wherein the non-error second dispenser dispenses drop only where the identified error first dispenser did not dispense drops in the pattern for the selected path” is not indefinite because a second interpretation contradicts other explicit limitations of the claims and thus is not an alternative interpretation. Appellant argues that that “non-error dispensers do not dispense at all”, as clear from the following limitations:

1. identifying error-dispensers (either “hard” or “soft” error dispensers);
2. depositing drops from non-error dispensers in the selected pattern; and
3. moving a second, redundant dispenser along the selected path while dispensing drops from a non-error second dispenser only where the identified error first dispenser did not dispense drops in the pattern for the selected path.

Reply after final rejection, at p. 10.

Appellant argues that Table II and its description, as disclosed by Kumar et al., clearly state that “non-error” dispensers dispense drops both at locations where identified error dispensers did not (i.e., where “error” dispense 146 did not) and at locations other than where identified error dispensers did not.

Appellant further argues that that modify the teachings of Kumar to comport with the limitation of fabricating an array that is a biopolymeric array would render the invention of Kumar unsuitable for its intended purpose because “[f]ailure to deposit at such ‘normal locations’ would result in a printed product that is missing deposited drops where drops should be: precisely the opposite result that Kumar et al. is trying to achieve”, (Reply after final rejection at p. 14).

Appellant's arguments, entered 10/9/2007, have been fully considered but they are not persuasive. Appellant's argument that one of skill in the art would be reasonably apprised of the scope of the claimed invention by inspection of the identified claim limitations is not persuasive, because included among these limitations is the language that is, itself, the subject of the rejection under 35 USC 112, second paragraph. The examiner respectfully submits that this argument appears to be circular in its reasoning.

The examiner respectfully submits the limitations "second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path" encompasses "non-error" dispensers dispense drops both at locations where identified error dispensers did not (i.e., where "error" dispense 146 did not) and at locations other than where identified error dispensers did not, as taught by Kumar.

Furthermore, in response to appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Appellant's arguments are directed at Kumar and not the combination of the references of Kumar and MacBeath.

The examiner respectfully submits that appellant's argument that the combination of Kumar and MacBeath would render the invention of Kumar unsuitable for its intended purpose because "[f]ailure to deposit at such 'normal locations' would result in a printed

product that is missing deposited drops where drops should be: precisely the opposite result that Kumar et al. is trying to achieve” is not persuasive or plausible. Kumar teaches a method of controlling error in array fabrication. Using the method of Kumar to print a biopolymeric array would not result in a printed product that is missing deposited drops where drops should be.

#### **(10) Response to Argument**

##### *Rejection Under 35 U.S.C. 112, Second Paragraph*

Appellant argues that the second interpretation contradicts other explicit limitations of the claims. In particular because identified error-dispensers in the claimed invention are actively excluded from dispensing drops anywhere in the selected path (i.e., only non-error dispensers are used for this purpose), it does not matter whether an error dispenser is a “hard” or “soft” error dispenser. Error dispensers are simply not used in the dispensing steps.

Appellant's arguments, entered 2/12/2008, have been fully considered but the examiner respectfully submits that they are not persuasive. Appellant's argument that one of skill in the art would be reasonably apprised of the scope of the claimed invention by inspection of the identified claim limitations is not persuasive, because included among these limitations is the language that is, itself, the subject of the rejection under 35 USC 112, second paragraph.

*Rejection Under 35 U.S.C. 112, First Paragraph, for New Matter*

Appellant argues that the asserted "alternative" interpretation of the claims set forth in the rejection is internally contradictory with other clear and unambiguous elements of the claims, as traversed *supra*. Specifically, appellant argues that the claims state that the error dispensers are not used at all to dispense drops in the selected pattern; only non-error dispensers do so. Therefore, in reading the claims as a whole, the claim limitation cannot encompass the alternative interpretations of the rejection.

Appellant's arguments, entered 2/12/2008, have been fully considered but the examiner respectfully submits that they are not persuasive. The claims now encompass methods wherein non-error second dispenser dispenses drops only in those locations on the substrate in the selected path of, e.g., a first group, (of which the identified error first dispense is a member), **only** where the identified error first dispenser did not dispense drops in the pattern for said selected path of the first group. The examiner respectfully notes that this limitation encompasses the dispensing of drops, by the non-error second dispenser, that avoid any droplets resulting from a "soft nozzle failure" that resulted in a solution break up into multiple smaller drop during firing of the identified error first dispenser, (see, Invention Disclosure reproduced in the Appendix of the Declaration by all of the instant inventors, entered 3/25/2005, at p. 31, first paragraph [entitled "Problem"]).

The examiner respectfully submits that this species of method is not described in the specification as filed. The specification does not describe methods wherein a non-

error second dispense only to those areas around imperfect deposition of droplets resulting from soft nozzle failures, as described in the inventor's declaration pursuant to 37 CFR 1.131. Therefore, one of skill in the art would not envision that appellant had possession of the full scope of the claimed invention.

*Rejection over 35 U.S.C. 102 (a, e)*

Appellant argues the patent of Kumar et al., describe "non-error" dispensers that dispense drops *both* at locations where identified errors dispensers did not dispense and at locations other than where identified error dispenser did not, (Kumar at Table II, describing where "error" dispenser 146 did not dispense). As an example from Table II, appellant states that dispenser 50 dispenses drops in location it would normally dispense, as well as where "error" dispenser 146 will not (i.e., in columns 3, 7, and 11 during Pass 2: boded 2s in Row 2). Appellant argues that this is in contrast to the instant claims, wherein the non-error dispensers dispense drops only at locations where identified error dispensers did not.

Appellant's arguments, entered 2/12/2008, have been fully considered but the examiner respectfully submits that they are not persuasive. The examiner respectfully notes that the claims require that "the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path". The examiner respectfully submits that because the identified "error dispense" 146, as taught by Kumar et al., is not used at all, and therefore did not

dispense any drops, the drops that the non-error dispenser 50 dispenses, are solely, i.e., only, are located where the identified error dispenser 146 did not dispense any drops.

*Rejection over 35 U.S.C. 103*

Appellant argues that the secondary reference of MacBeath et al. does not remedy the failure of Kumar et al., as stated above. Appellant argues that modification of the teachings of Kumar et al. to comport with the claimed invention would render it unsuitable for its intended purpose because failure to deposit drops at the normal locations of the "non-error" dispenser would result in a printed product that is missing deposited drops where drops should be

Appellant's arguments, entered 2/12/2008, have been fully considered but the examiner respectfully submits that they are not persuasive.

The examiner respectfully notes that the claims require that "the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path". The examiner respectfully submits that because the identified "error dispense" 146, as taught by Kumar et al., is not used at all, and therefore did not dispense any drops, the drops that the non-error dispenser 50 dispenses, are solely, i.e., only, are located where the identified error dispenser 146 did not dispense any drops.

Furthermore, in response to appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Appellant's arguments are directed at Kumar and not the combination of the references of Kumar and MacBeath.

The examiner respectfully submits that appellant's argument that the combination of Kumar and MacBeath would render the invention of Kumar unsuitable for its intended purpose because “[f]ailure to deposit at such ‘normal locations’ would result in a printed product that is missing deposited drops where drops should be: precisely the opposite result that Kumar et al. is trying to achieve” is not persuasive or plausible. Kumar teaches a method of controlling error in array fabrication. Using the method of Kumar to print a biopolymeric array would not result in a printed product that is missing deposited drops where drops should be.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Mark L. Shibuya, Ph.D./  
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/JD Schultz, PhD/  
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